§ 27.37 Tests to determine adequacy of safety devices for bulbs.

The glass envelope of bulbs with the filament incandescent at normal operating voltage shall be broken in flammable methane-air or natural gas-air mixtures in a gallery to determine that the safety device will prevent ignition of the flammable mixtures.

§ 27.38 Tests to determine adequacy of windows and lenses.

Impact tests. A 4-pound cylindrical weight with a one-inch diameter hemispherical striking surface will be dropped (free fall) to strike the window or lens in its mounting or the equivalent thereof at or near the center. At least three out of four samples shall withstand the impact according to the following table:

Overall lens diameter (inches)	Height of fall (inches)
Less than 4	6
4 to 5	9
5 to 6	15
Greater than 6	24

Lenses or windows of smaller diameter than 1 inch may be tested by alternate methods at the discretion of MSHA.

§ 27.39 Tests to determine resistance to vibration.

(a) *Laboratory tests for reliability and durability.* Components, subassemblies, or assemblies that are to be mounted on permissible and approved equipment shall be subjected to two separate vibration tests, each of one-hour duration. The first test shall be conducted at a frequency of 30 cycles per second with a total movement per cycle of 1/16-inch. The second test shall be conducted at a frequency of 15 cycles per second with a total movement per cycle of 1/8-inch. Components, subassemblies, and assemblies shall be secured to the vibration testing equipment in their normal operating positions (with shock mounts, if regularly provided with shock mounts). Each component, subassembly and assembly shall function normally during and after each vibration test.

NOTE: The vibrating equipment is designed to impart a circular motion in a plane inclined 45° to the vertical or horizontal.

(b) *Field tests.* MSHA reserves the right to conduct tests to determine resistance to vibration in underground workings to verify the reliability and durability of a methane-monitoring system or component(s) thereof where installed in connection with a piece of mining equipment.

§ 27.40 Test to determine resistance to dust.

Components, subassemblies, or assemblies, the normal functioning of which might be affected by dust, such as coal or rock dust, shall be tested in an atmosphere containing an average concentration (50 million minus 40 micron particles per cubic foot) of such dust(s) for a continuous period of 4 hours. The component, subassembly, or assembly shall function normally after being subjected to this test.

NOTE: Dust measurements, when necessary, shall be made by impinger sampling and light-field counting technique.

§ 27.41 Test to determine resistance to moisture.

Components, subassemblies, or assemblies, the normal functioning of which might be affected by moisture, shall be tested in atmospheres of high relative humidity (80 percent or more at 65°–75 °F.) for continuous operating and idle periods of 4 hours each. The component or subassembly or assembly shall function normally after being subjected to those tests.

PART 28—FUSES FOR USE WITH DIRECT CURRENT IN PROVIDING SHORT-CIRCUIT PROTECTION FOR TRAILING CABLES IN COAL MINES

Subpart A—General Provisions

Sec.
28.1 Purpose.
28.2 Approved fuses.
28.3 Installation, use, and maintenance of approved fuses.
28.4 Definitions.

Subpart B—Application for Approval

28.10 Application procedures.

Subpart C—Approval and Disapproval

28.20 Certificates of approval; scope of approval.
28.21 Certificates of approval; contents.
28.22 Notice of disapproval.
28.23 Approval labels or markings; approval of contents; use.
28.24 Revocation of certificates of approval.
28.25 Changes or modifications of approved fuses; issuance of modification of certificate of approval.

Subpart D—Quality Control

28.30 Quality control plans; filing requirements.
28.31 Quality control plans; contents.
28.32 Proposed quality control plans; approval by MSHA.
28.33 Quality control test methods, equipment, and records; review by MSHA: revocation of approval.

Subpart E—Construction, Performance and Testing Requirements

28.40 Construction and performance requirements; general.
28.41 Testing requirements; general.

AUTHORITY: 30 U.S.C. 957, 961.

SOURCE: 37 FR 7562, Apr. 15, 1972, unless otherwise noted.

Subpart A—General Provisions

§ 28.1 Purpose.

The purpose of the regulations contained in this Part 28 is: (a) To establish procedures and prescribe requirements which must be met in filing applications for the approval of fuses for use with direct current in providing short-circuit protection for trailing cables in coal mines, or the approval of changes or modifications of approved fuses; (b) to specify minimum performance requirements and to prescribe methods to be employed in conducting inspections, examinations, and tests to determine the effectiveness of fuses for use with direct current in providing short-circuit protection for trailing cables in coal mines; and (c) to provide for the issuance of certificates of approval or modifications of certificates of approval for fuses which have met the minimum requirements for performance and short-circuit protection set forth in this part.

§ 28.2 Approved fuses.

(a) On and after the effective date of this part, fuses shall be considered to be approved for use with direct current in providing short-circuit protection for trailing cables in coal mines only where such fuses are: (1) The same in all respects as those fuses which have been approved after meeting the minimum requirements for performance and short-circuit protection prescribed in this Part 28; and (2) maintained in an approved condition.

§ 28.3 Installation, use, and maintenance of approved fuses.

Approved fuses shall be installed and maintained in accordance with the specifications prescribed by the manufacturer of the fuses, and shall be selected and used in accordance with the standards prescribed for short-circuit protective devices for trailing cables in Parts 75 and 77, Subchapter O of this chapter.

§ 28.4 Definitions.

As used in this part—

(a) *Applicant* means an individual, partnership, company, corporation, association, or other organization that designs, manufactures, assembles, or fabricates, or controls the design, manufacture, assembly, or fabrication of a fuse, and who seeks to obtain a certificate of approval for such fuse.

(b) *Approval* means a certificate or formal document issued by MSHA stating that an individual fuse or combination of fuses has met the minimum requirements of this Part 28, and that the applicant is authorized to use and attach an approval label or other equivalent marking to any fuse manufactured, assembled, or fabricated in conformance with the plans and specifications upon which the approval was based, as evidence of such approval.

(c) *Approved* means conforming to the minimum requirements of this Part 28.

(d) *MESA* means the United States Department of the Interior, Mining Enforcement and Safety Administration. Predecessor organization to MSHA, prior to March 9, 1978.

(e) *MSHA* means the United States Department of Labor, Mine Safety and Health Administration.

(f) *Fuse* means a device, no less effective than an automatic circuit breaker, for use with direct current which provides short-circuit protection for trailing cables in coal mines by interrupting an excessive current in the circuit.

[37 FR 7562, Apr. 15, 1972, as amended at 39 FR 24003, June 28, 1974; 43 FR 12316, Mar. 24, 1978]

Subpart B—Application for Approval

§ 28.10 Application procedures.

(a) Each applicant seeking approval of a fuse for use with direct current in providing short-circuit protection for trailing cables shall arrange for submission, at applicant's own expense, of the number of fuses necessary for testing to a nationally recognized independent testing laboratory capable of performing the examination, inspection, and testing requirements of this part.

(b) The applicant shall insure, at his own expense, that the examination, inspection, and testing requirements of this part are properly and thoroughly performed by the independent testing laboratory of his choice.

(c) Upon satisfactory completion by the independent testing laboratory of the examination, inspection, and testing requirements of this part, the data and results of such examination, inspection, and tests shall be certified by both the applicant and the laboratory and shall be sent for evaluation of such data and results to the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059. Fees calculated in accordance with part 5 of this title shall be submitted in accordance with § 5.40.

(d) The certified data and results of the examinations, inspections, and tests required by this part and submitted to MSHA for evaluation shall be accompanied by a proposed plan for quality control which meets the minimum requirements set forth in Subpart D of this part.

(e) Each applicant shall deliver to MSHA at his own expense, three fuses of each size and type which may be necessary for evaluation of the examination, inspection, and test results by the Bureau.

(f) Applicants or their representatives may visit or communicate with Approval and Certification Center in order to discuss the requirements for approval of any fuse, or to obtain criticism of proposed designs; no charge shall be made for such consultation and no written report shall be issued by MSHA as a result of such consultation.

[37 FR 7562, Apr. 15, 1972, as amended at 43 FR 12316, Mar. 24, 1978; 52 FR 17515, May 8, 1987; 60 FR 35694, July 11, 1995; 70 FR 46343, Aug. 9, 2005; 73 FR 52212, Sept. 9, 2008]

Subpart C—Approval and Disapproval

§ 28.20 Certificates of approval; scope of approval.

(a) MSHA shall issue certificates of approval pursuant to the provisions of this subpart only for individual, completely fabricated fuses which have been examined, inspected, and tested as specified in § 28.10, and have been evaluated by MSHA to ensure that they meet the minimum requirements prescribed in this part.

(b) MSHA shall not issue an informal notification of approval.

§ 28.21 Certificates of approval; contents.

(a) Each certificate of approval shall contain a description of the fuse and a classification of its current-interrupting capacity and current rating.

(b) The certificate of approval shall specifically set forth any restrictions or limitations on the use of the fuse in providing short-circuit protection for trailing cables.

(c) Each certificate of approval shall be accompanied by a reproduction of the approval label or marking design, as appropriate, to be employed by the applicant with each approved fuse as provided in § 28.23.

(d) No test data or specific laboratory findings will accompany any certificate of approval; however, MSHA will release analyses of pertinent test data and specific findings upon receipt of a written request by the applicant, or when required by statute or regulation.

(e) Each certificate of approval shall also contain the approved quality control plan as specified in § 28.31.

§ 28.22 Notice of disapproval.

(a) If, upon completion of the evaluation by MSHA conducted in accordance with § 28.10, it is determined that the fuse does not meet the minimum requirements set forth in this part, MSHA shall issue a written notice of disapproval to the applicant.

(b) Each notice of disapproval shall be accompanied by all available findings with respect to the defects of the fuse for which approval was sought with a view to the possible correction of any such defects.

(c) MSHA shall not disclose, except to the applicant upon written request or when required by statute or regulation, any data, findings, or other information with respect to any fuse for which a notice of disapproval is issued.

§ 28.23 Approval labels or markings; approval of contents; use.

(a) Approval labels shall bear the emblem of the Mine Safety and Health Administration, an approval number, the restrictions, if any, placed upon the use of the fuse by MSHA, and where appropriate, the applicant's name and address.

(b) Upon receipt of a certificate of approval, the applicant shall submit to MSHA, for approval of contents, full-scale reproductions of approval labels or markings, as appropriate, and a sketch or description of the method of application and position on the fuse, together with instructions for the installation, use, and maintenance of the fuse.

(c) Legible reproductions or abbreviated forms of the label or markings approved by MSHA shall be attached to or printed on each fuse.

(d) Each fuse shall be marked with the rating of the Underwriters Laboratories, Inc.

(e) MSHA shall, where necessary, notify the applicant when additional labels, markings, or instructions will be required.

(f) Approval labels or markings shall only be used by the applicant to whom they were issued.

(g) The use of any MSHA approval label or marking obligates the applicant to whom it is issued to maintain or cause to be maintained the approved quality control sampling procedure and the acceptable quality level for each characteristic tested, and to guarantee that the approved fuse is manufactured according to the specifications upon which the certificate of approval is based.

(h) The use of any MSHA approval label or marking obligates the applicant to whom it is issued to retest the approved fuse within a 2-year period from the date of the certificate of approval, and every 2 years thereafter, in accordance with the provisions of § 28.10.

[37 FR 7562, Apr. 15, 1972, as amended at 43 FR 12316, Mar. 24, 1978; 45 FR 68935, Oct. 17, 1980]

§ 28.24 Revocation of certificates of approval.

MSHA reserves the right to revoke, for cause, any certificate of approval issued pursuant to the provisions of this part. Such causes include, but are not limited to, misuse of approval labels and markings, misleading advertising, violations of section 110(h) of the Federal Mine Safety and Health Act of 1977 and failure to maintain or cause to be maintained the quality control requirements of the certificate of approval.

[37 FR 7562, Apr. 15, 1972, as amended at 43 FR 12316, Mar. 24, 1978]

§ 28.25 Changes or modifications of approved fuses; issuance of modification of certificate of approval.

(a) Each applicant may, if he desires to change any feature of an approved fuse, request a modification of the original certificate of approval issued by MSHA for such fuse by filing an application for modification in accordance with the provisions of this section.

(b) Applications, including fees, shall be submitted as specified in § 28.10 for an original certificate of approval, with a request for a modification of the existing certificate to cover any proposed change.

(c) The application for modification, together with the examination, inspection, and test results prescribed by § 28.10 shall be examined and evaluated by MSHA to determine if the proposed modification meets the requirements of this part.

(d) If the proposed modification meets the requirements of this part, a formal modification of approval will be issued, accompanied, where necessary, by reproductions of revised approval labels or markings.

Subpart D—Quality Control

§ 28.30 Quality control plans; filing requirements.

As a part of each application for approval or modification of approval submitted pursuant to this part, each applicant shall file with MSHA a proposed quality control plan which shall be designed to assure the quality of short-circuit protection provided by the fuse for which approval is sought.

§ 28.31 Quality control plans; contents.

(a) Each quality control plan shall contain provisions for the management of quality, including:

(1) Requirements for the production of quality data and the use of quality control records;

(2) Control of engineering drawings, documentations, and changes;

(3) Control and calibration of measuring and test equipment;

(4) Control of purchased material to include incoming inspection;

(5) Lot identification, control of processes, manufacturing, fabrication, and assembly work conducted in the applicant's plant;

(6) Audit or final inspection of the completed product; and,

(7) The organizational structure necessary to carry out these provisions.

(b) The sampling plan shall include inspection tests and sampling procedures developed in accordance with Military Specification MIL-F-15160D, ''Fuses; Instrument, Power, and Telephone'' (which is hereby incorporated by reference and made a part hereof), Group A tests and Group B tests, except that the continuity and/or resistance characteristics of each fuse shall be tested. Military Specification MIL–F–15160D is available for examination at the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059. Copies of the document may be purchased from Information Dissemination (Superintendent of Documents), P.O. Box 371954, Pittsburgh, PA 15250–7954; Telephone: 866–512–1800, *http://bookstore.gpo.gov*.

(c) The sampling procedure shall include a list of the characteristics to be tested by the applicant or his agent and shall include but not be limited to:

(1) Continuity and/or resistance determination for each fuse;

(2) Carry current capability (not less than 110 percent of the rated current); and,

(3) Overload current interruption capability (not less than 135 percent of the rated current).

(d) The quality control inspection test method to be used by the applicant or his agent for each characteristic required to be tested shall be described in detail.

[37 FR 7562, Apr. 15, 1972, as amended at 43 FR 12316, Mar. 24, 1978; 60 FR 35694, July 11, 1995; 71 FR 16666, Apr. 3, 2006; 73 FR 52212, Sept. 9, 2008]

§ 28.32 Proposed quality control plans; approval by MSHA.

(a) Each proposed quality control plan submitted in accordance with this subpart shall be reviewed by MSHA to determine its effectiveness in insuring the quality of short-circuit protection provided by the fuse for which an approval is sought.

(b) If MSHA determines that the proposed quality control plan submitted by the applicant will not insure adequate quality control, MSHA shall require the applicant to modify the procedures and testing requirements of the plan prior to approval of the plan and issuance of any certificate of approval.

(c) Approved quality control plans shall constitute a part of and be incorporated into any certificate of approval issued by MSHA, and compliance with such plans by the applicant shall be a condition of approval.

§ 28.33 Quality control test methods, equipment, and records; review by MSHA; revocation of approval.

(a) MSHA reserves the right to have its representatives inspect the applicant's quality control test methods, equipment, and records, and to interview any employee or agent of the applicant in regard to quality control test methods, equipment, and records.

(b) MSHA reserves the right to revoke, for cause, any certificate of approval where it finds that the applicant's quality control test methods, equipment, or records do not ensure effective quality control over the fuse for which the approval was issued.

Subpart E—Construction, Performance, and Testing Requirements

§ 28.40 Construction and performance requirements; general.

(a) MSHA shall issue approvals for fuses for use with direct current in providing short-circuit protection for trailing cables, when such fuses have met the minimum construction, performance, and testing requirements set forth in this subpart.

(b) Fuses submitted to MSHA for approval will not be accepted unless they are designed on sound engineering and scientific principles, constructed of suitable materials, and evidence good workmanship.

(c) Fuses may be single-element or dual-element in type, however, they shall be capable of interrupting any direct current within a range from the ampere rating of the fuse under consideration for approval up to 20,000 amperes.

(d) MSHA shall accept the fuse size and ampere rating as specified in the Underwriters Laboratories, Inc., standard for alternating current fuses (UL–198), which is hereby incorporated by reference and made a part hereof. This document is available for examination at the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059, and copies of the document are available from COMM 2000, 1414 Brook Drive, Downers Grove, IL 60515; Telephone: 888–853–3512 (toll free); *http://ulstandardsinfonet.ul.com.*

(e) Fuses shall be capable of completely interrupting a current within 30 milliseconds after initial current interruption, and shall not show any evidence of restriking after 30 milliseconds.

(f) The blown fuse shall show only superficial damage.

[37 FR 7562, Apr. 15, 1972, as amended at 43 FR 12316, Mar. 24, 1978; 60 FR 35694, July 11, 1995; 71 FR 16666, Apr. 3, 2006; 73 FR 52213, Sept. 9, 2008]

§ 28.41 Testing requirements; general.

(a) The open circuit voltage of the test circuit shall be 300 volts d.c., or 600 volts d.c., depending on the voltage rating of the fuse being tested.

(b) Time constant of the circuit (defined as T=L/R, where T is the time in seconds, L is the inductance in henries, and R is the resistance in ohms) shall be as follows:

(1) For 10,000 amperes and greater currents, T=0.016 second or more;

(2) For 1,000 amperes to 10,000 amperes, T=0.008 second or more;

(3) For 100 amperes to 1,000 amperes, T=0.006 second or more; and

(4) For less than 100 amperes, T=0.002 seconds or more.

(c) Test currents shall be as follows:

(1) 200 percent of rated current for fuses having 200 or less ampere rating, or 300 percent of rated current for fuses having greater than 200 ampere rating;

(2) 900 percent of rated current;

(3) 10,000 amperes; and

(4) 20,000 amperes.

(d) The voltage shall continue to be applied for at least 30 seconds after completion of circuit interruption.

(e) Five fuses of each case size shall be tested at each test current specified in paragraph (c) of this section, with the value of the fuse being the maximum value for the case size.

(f) Three of each lot of five fuses shall be preconditioned at 95 ±5 percent RH for not less than 5 days immediately prior to testing; and the other two fuses of each lot of five shall be preconditioned by heating to 90 °C. for 24 hours, and tested within 1 hour after removal from the preconditioning chamber.

(g) At least three of each lot of five fuses shall be tested in a fuse holder of a trolley-tap type, and the fuse holder shall remain intact and shall readily accept and retain a replacement fuse.

PART 33—DUST COLLECTORS FOR USE IN CONNECTION WITH ROCK DRILLING IN COAL MINES

Subpart A—General Provisions

Sec.
33.1 Purpose.
33.2 Definitions.
33.3 Consultation.
33.4 Types of dust collectors for which certificates of approval may be granted.
33.5 [Reserved]
33.6 Application procedures and requirements.
33.7 Date for conducting tests.
33.8 Conduct of investigations, tests, and demonstrations.
33.9 Certification of dust-collecting systems.
33.10 Certificates of approval or performance.
33.11 Approval plates.
33.12 Changes after certification.
33.13 Withdrawal of certification.

Subpart B—Dust-Collector Requirements

33.20 Design and construction.
33.21 Modification of test equipment.
33.22 Mode of use.
33.23 Mechanical positioning of parts.

Subpart C—Test Requirements

33.30 Test site.
33.31 Test space.
33.32 Determination of dust concentration.
33.33 Allowable limits of dust concentration.
33.34 Drilling test.
33.35 Methods of drilling; dust-collector unit.
33.36 Method of drilling; combination unit or dust-collecting system.
33.37 Test procedure.
33.38 Electrical parts.

AUTHORITY: 30 U.S.C. 957, 961.

SOURCE: Schedule 25B, 25 FR 6473, July 9, 1960, unless otherwise noted.

Subpart A—General Provisions

§ 33.1 Purpose.

The regulations in this part set forth the requirements for dust collectors used in connection with rock drilling in coal mines to procure their certification as permissible for use in coal mines; procedures for applying for such certification; and fees.

§ 33.2 Definitions.

As used in this part:

(a) *Permissible*, as applied to a dust collector, means that it conforms to the requirements of this part, and that a certificate of approval to that effect has been issued.

(b) *Bureau* means the United States Bureau of Mines.

(c) *Certificate of approval* means a formal document issued by MSHA stating that the dust collector unit or combination unit has met the requirements of this part, and authorizing the use and attachment of an official approval plate or a marking so indicating.

(d) *Certificate of performance* means a formal document issued by MSHA stating that a dust-collecting system has met the test requirements of Subpart C of this part and therefore is suitable for use as part of permissible units.

(e) *Dust-collector unit* means a complete assembly of parts comprising apparatus for collecting the dust that results from drilling in rock in coal mines, and is independent of the drilling equipment.

(f) *Combination unit* means a rock-drilling device with an integral dust-collecting system, or mining equipment with an integral rock-drilling device and dust-collecting system.

(g) *Dust-collecting system* means an assembly of parts comprising apparatus for collecting the dust that results from drilling in rock and is dependent upon attachment to other equipment for its operation.

(h) *Applicant* means an individual, partnership, company, corporation, association, or other organization that designs and manufactures, assembles or controls the assembly of a dust-collecting system, dust-collector unit, or a combination unit, and seeks certification thereof.

(i) *MSHA* means the United States Department of Labor, Mine Safety and Health Administration.

[Sched. 25B, 25 FR 6473, July 9, 1960, as amended at 39 FR 24005, June 28, 1974; 43 FR 12317, Mar. 24, 1978]